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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,904	09/28/2001	J. G. Walacavage	200-0665	4251

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EXAMINER	
PROCTOR, JASON SCOTT	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,904	WALACAVAGE ET AL.	
	Examiner	Art Unit	
	Jason Proctor	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/13/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-15 were presented for examination. Claims 1-15 were rejected in Office Action mailed on 4 February 2005. Applicants have amended claims 1, 5, 9, and 15 in response dated 6 June 2005. Claims 1-15 have been submitted for reconsideration.

NP Claims 1-15 have been ~~cancelled.~~ examined.

Response to Double Patenting Rejection

1. The Examiner thanks Applicants for clarifying for the record the distinguishing features claimed in US Patent Application No. 09/965,905 in contrast to the instant application. In particular, Applicants' argue primarily that:

> Claim 1 of co-pending Application No. 09/965,905 is claiming a method of part flow for a programmable logic controller logical verification system including constructing a simulation model of a part flow in a manufacturing line using a computer [...] Claim 1 of the present application does not claim this feature.
>
> Further, claim 1 of the present application claims a method of logical modeling operator interaction with a programmable logic controller logical verification system including constructing a flowchart of interaction of an operator in a workcell using a computer [...] Claim 1 of co-pending Application No. 09/965,905 does not claim this feature.

Applicants' arguments have been fully considered and found persuasive. The previous double patenting rejection based on US Patent Application No. 09/965,905 has been withdrawn.

Response to Rejections under 35 U.S.C. § 101

2. The Examiner thanks Applicants for amending independent claims 1, 9, and 15 to positively recite the use of a computer in performing the methods of simulation. This language

restricts the broadest reasonable interpretation of the claims to the technological arts and obviates the previous rejections under 35 U.S.C. § 101. Those rejections have been withdrawn.

Response to Rejections under 35 U.S.C. § 112, second paragraph

3. The Examiner thanks Applicants for amending the claims to clarify the patent protection sought by Applicants. The previous rejections under 35 U.S.C. § 112, second paragraph, have been withdrawn.

Response to Rejections under 35 U.S.C. § 102

4. Regarding the rejection of claims 1-21 under 35 U.S.C. § 102(b) as being anticipated by "Handbook of Simulation", edited by Jerry Banks, Applicants argue primarily that:

> Banks does not disclose constructing a flowchart of interaction of an operator in a workcell using a computer and testing whether logic of the flowchart is correct. Banks also does not disclose using the flowchart to test PLC code and building the workcell if the logic of the flowchart is correct.

The Examiner concurs that Banks does not anticipate the amended claim language. Applicants' arguments have been fully considered and have been found persuasive. The previous rejections under 35 U.S.C. § 102(b) have been withdrawn.

Outstanding Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over "Simulation and Production Planning for Manufacturing Cells" by Shahram Taj, David S. Cochran, James W. Duda, and Jochen Linck (Taj) in view of "Emulation of a Material Delivery System" by Todd LeBaron and Kelly Thompson (LeBaron).

Regarding claims 1-5, 8-12, and 15, Taj discloses a method of logical modeling operator interaction [*"The LABOR element in Witness is used to represent the operator."* (page 975, Modeling)] comprising the steps of:

Constructing a flowchart of interaction of an operator in a workcell using a computer [*"a medium sized cell was selected for further investigation. A schematic of this cell is shown in Figure 2* [...] *Figure 3 shows the operator standard work chart for a medium sized cell."* (page 974, Cell Design) These figures (Figure 3 in particular) show the flowchart of interaction that is constructed in the computer simulation: *"The new cell design was modeled in Witness. The*

LABOR element in Witness is used to represent the operator. [...] *For Operator Task 1 (Figure 3)"* etc. (page 975, Modeling)];

Testing whether logic of the flowchart is correct [*"The cell performance was to meet customer volume and mix requirements on a daily basis. The model was run for 10 weeks."*, (page 977, from page 976, Simulation Run); *"The simulation results showed that not all part types can be produced in a JIT environment due to long set ups and downtimes."* (page 977, Findings)]; and

Building the workcell if the logic of the flowchart is correct [*"The purpose of this study is to show how simulation can be used to examine the feasibility of converting an existing system to a cellular manufacturing system"*; *"management desired to replace the old equipment with machines using more modern technology"*; *"An ideal, lean cell* [...] *would have all machines needed to process a part located very close together"* (page 973, Introduction)].

Taj discloses starting a timer and determining whether the operator interaction is completed within a predetermined time [Figure 3 shows the flowchart of interaction that is constructed in the computer simulation: *"The new cell design was modeled in Witness. The LABOR element in Witness is used to represent the operator.* [...] *For Operator Task 1 (Figure 3)"* etc. (page 975, Modeling); Figure 3 shows the time for the operator interaction. OP 10 involves 8 seconds of interaction (Take 2 part R from tub and load into OP 10 [8 sec.]) and 6 seconds of walking, etc. Modeling this interaction necessitates a concept of timing in the simulation, ergo a timer.]

Taj discloses initializing the operator interaction [*"When the simulation starts, the operator position is zero."* (page 976, from page 975, Modeling)].

Taj discloses idling the operator prior to starting the timer [As disclosed (pages 975-976, Modeling), the operator begins work and the timer starts at the beginning of the simulation. Therefore the operator is inherently idle before the timer is started.].

Taj discloses constructing a series of commands for the operator using the computer [Figure 3 shows the flowchart of interaction that is constructed in the computer simulation: *"The new cell design was modeled in Witness. The LABOR element in Witness is used to represent the operator.* [...] *For Operator Task 1 (Figure 3)"* etc. (page 975, Modeling)].

Taj does not expressly disclose modeling the operator interaction with *a programmable logic controller logical verification system*. Taj discloses operators interacting with machines [*"An operator with position zero is required for this machine during the cycle time"* etc. (page 975, Modeling)].

LeBaron discloses a programmable logic controller logical verification system [*"Routing logic, PLC or PC control software, sequencing algorithms, and more can be integrated, tested, and debugged within a simulation environment."* (page 1055, Abstract); *"Emulation provides the graphical and statistical output needed to accurately evaluate different algorithms and control logic."* (page 1060, Summary)].

It would have been obvious to a person of ordinary skill in the art to combine the concept of emulating the PLC control software as taught by LeBaron with the modeling of operator interaction taught by Taj to arrive at a simulation and verification system wherein both the operator and the PLC control software is modeled. Motivation to do so is expressly taught by LeBaron [*"Routing logic, PLC or PC control software, sequencing algorithms, and more can be integrated, tested, and debugged within a simulation environment."* (page 1055, Abstract)]. The combination embraces the advantages of both simulating operator interaction and debugging PLC control software. The combination could be formed by interfacing the MACHINE components of Witness (taught by Taj, page 975, Modeling) to the PLC control software emulator (taught by LeBaron, page 1055, Emulation) so that the MACHINE components behave according to their corresponding PLC control software.

Regarding claims 6-7 and 13-14, Taj discloses that the operator commands have at least one resource and the resource has at least one capability [*"Load 2 P parts and 2 R parts pallet"*, (Operator Task 6, Figure 3). This exemplary command requires a resource (*pallet*) that has a capability (*capable of receiving 2 P parts and 2 R parts*).].

Conclusion

Art considered pertinent by the examiner but not applied has been cited on form PTO-892.

New grounds of rejection not necessitated by Applicants' amendments have been entered in this action. As a result, this action is NON-FINAL.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached at (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Proctor
Examiner
Art Unit 2123

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